DOCUMENT RESUME

ED 190 543 SP 016 476

AUTHOR Rothstein, Pauline M.
TITLE The Development of a Model in Information Utilization Skills for Education Students.
PUB DATE Apr 80
NOTE 19p.: Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 8, 1980).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Educational Resources: Information Utilization: *Library Services: *Library Skills: *Preservice Teacher Education: *Reference Materials

ABSTRACT

The Training System Model (TSM) is designed to prepare education students to find and use information sources effectively for course assignments. It describes how a basic information utilization skills training program can be constructed for education students with different information needs. Training in information utilization skills as described in this model includes basic library research skills as well as skills needed to employ information sources and services outside the traditional library. (Author/JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED190543

JUN 1980
RECEIVED
ERIC/TM

The Development of a Model in Information Utilization Skills for Education Students

Pauline M. Rothstein
ERIC Clearinghouse on Urban Education
New York, N.Y.

Paper presented at the symposium on Building Communication Models at the annual meeting of the American Educational Research Association (Boston, April 8, 1980)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Paula M. Rothstein
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SP 016 476

The Training System Model (TSM) is designed to prepare education students to find and use information sources effectively for course assignments. It describes how a basic information utilization skills training program can be constructed for education students with different information needs under diverse circumstances. Training in information utilization skills as described in this model includes basic library research skills but also includes skills needed to increase student awareness of information sources and services outside of the traditional library.

The approach to model building used by Hawes (1975) was used as the basis for building the Training System Model (TSM). In this approach, the construction of a model begins with the selection of an analogue for model building. The General Systems Theory analogue was selected as the analogue for the Training System Model (TSM).

Hawes (1975) described seventy-two different types of models which could be constructed. He suggested that models could be built using four types of structures, six types of substances and three types of forms.

The spatio-temporal structure was used to build the Training System Model (TSM) because in this structure "the elements of the structure are related to one another in time and in a multidimensional space" (Hawes, 1975, p. 130). Hawes (1975) noted that in the spatio-temporal structure different modes of behavior - behavior occurring at different

points in behavior space - function to clarify past behavior and redefine or focus more clearly on future objectives (the past and future here refer to behavioral time). In the spatio-temporal structure " it is the interaction of behavioral time and space and their coordinates at any given instant that defines the purpose of the cybernetic system" (p. 130).

The purpose of the Training System Model (TSM) is to demonstrate a process which changes in space over time. This process is the training of education students in a school of education in information utilization skills. According to the Training System Model (TSM) students will behave so as to find needed information to fulfill course assignments. In this process they will clarify past behavior (what information retrieval they have done, what information they have found, what information seeking skills they have) and redefine future objectives (what information seeking skills they need, what information they need).

The spatio-temporal structure is used for a model where the elements of the structure are related to one another in time and space. The elements of the structure of the Training System Model (TSM), its subsystems are related in this way (see Figure 2, p. 9) In the TSM interaction occurs between each subsystem, the learner system, the school of education program system and the information system, and the training system. The nature of this interaction may be different with each subsystem. However, it is the interdependence between each subsystem and the total training system that characterizes the TSM structure.

The school of education program system serves as the environment for the training system. In this environment, the learner chooses an education course assignment as the context for training. He is then trained in the skills needed to use information services and find information sources which will help him to complete his assignment. As part of this process the learner interacts with the education professor whose course assignment he has chosen as the context for training and with the trainer.

In the Training System Model (TSM) feedback derived from any one of the three subsystems may help to redefine any of the subsystems and/or the training system in terms of both past behavior and future objectives. Thus, specific elements of the learner system the school of education program system and/or the information system may be changed when the training system is implemented again.

The hierarchical structure described by Hawes (1975) is not applicable to the Training System Model (TSM) as a whole. However, it is evident in each of the subsystems. In the learner system there are graduate and undergraduate students. In the school of education program system the hierarchical structure occurs in the staffing pattern of the school from Dean, Chairman, Professor, Associate Professor continuing downward to Graduate Student Assistant. In parts of the information system the hierarchical structure is apparent in libraries or information centers where specific sources or services are available only to persons at specific levels in the learner system or the school of education program system hierarchy.

For example, library stacks and interlibrary loan privileges may be available only to graduate students and teaching faculty.

The grouping structure described by Hawes (1975) is apparent in the information system where the emphasis is on finding similarities across levels and grouping them rather than finding distinctions and separating them. For example, card catalogs, book catalogs, printed indexes and data base citations all present the same kind of bibliographic information (names, dates, places of publication). The grouping structure can be used to present this kind of information.

Hawes (1975) described six substances which characterize analogues as used for model building. The Training System Model (TSM) uses two of these substances, exchange and adaptation. The exchange analogue is present in the interaction betweeen each of the subsystems and the training system (see Figure 2, p.9). Exchange takes place when messages as input, are sent from the learner system, the school of education program system and the information system to the training system (through student work and evaluations of the system) to each of the subsystems (see Table I).

In the adaptation analogue as applied to the TSM, the feedback mechanism operates to promote modified behavior. In this way evaluation and assessment procedures can change future methods of implementing the Training System Model (TSM). In addition to changing or modifying the TSM, adaptation can also serve to change any one of the subsystems. Thus, if feedback from the exchange mechanism indicates that students

have difficulty choosing information sources, more structured source lists can be used in the next training system implementation.

The form selected for the Training System Model (TSM) was the conceptual form. Using the conceptual form, the internal structure of the General Systems Theory analogue was used for the TSM. The use of the conceptual model form dictated that one of the criteria for judging the TSM be the degree to which it is isomorphic to the General Systems Theory analogue.

G. S. Maccia (1963) developed an educational theory model in which he described the school as a system consisting of four subsystems: the administrating unit, the inquiring unit, the teaching unit and the facilitating unit. This model was designed to serve as an example of how General Systems Theory could be used to generate educational theory models. G. S. Maccia (1963) used "retroduction", a method described by E. S. Maccia et al. (1963, p. 33) as the utilization of a point of view as a model for devising educational theory. Using retroduction, descriptive terms in the theory of the better known area are put into one-to-one correspondence with those of the new area. In this way the concepts of the better known theory are replaced by concepts in the new area and a set of hypotheses about the variables in the new area is generated.

G. S. Maccia (1963) outlined basic statements which described the characterization, properties and action of a system. For each area statements based on primaty source material

from General Systems Theory theorists were generated and sub-statements derived from them were listed. G.S. Maccia (1963) applied these statements to his model of the school as an open system.

The statements and sub-statements generated by G.S. Maccia (196 to describe an educational theory model based on General Systems Theory were used to generate the Training System Model (TSM).

The TSM operates with input from three subsystems: the learner system, the school of education program system and the information system. This input is in the form of demands and resources (see Table I, p. 10). There is output from the training system which results in changes in each of the three subsystems. This output is transmitted to the training system and to each of the three subsystems in the form of feedback which may modify or change aspects of the entire Training System or any of the three subsystems.

In addition to the input and output between the training system and each of the three subsystems, there is input and output between the subsystems. The learner system needs the output of the information system. This output may include information sources and services. The information system demands output from the learner system in the form of information seeking skills. The school of education program system provides input and demands output from the learner system in the form of assignments directed by coursework. The output of the entire training system is dependent on the actions within and

between the subsystems. The feedback from each of the three subsystems is used by the training system to grow and develop.

The characterization of the information utilization training system model as a system provides a detailed analysis of the system in which student work occurs. It includes an analysis of the system, the environment and the boundaries in which the training system operates.

The properties of the training system are described using the concepts of the multisystem and the open system (see Figure 1, p. 8). The properties of the Training System Model (TSM) are also described using eleven other General Systems Theory concepts. These concepts include regulation, adaptation, wholeness and compatibility.

In the Training System Model (TSM) the actions of the training system are described in terms of eleven concepts from General Systems Theory. These concepts include exponential growth, alteration, feedback and degeneration and output transmission.

The Training System Model (TSM) was used to develop a training system in information utilization skills for education students. Figure 3, illustrates the process components of this training system.

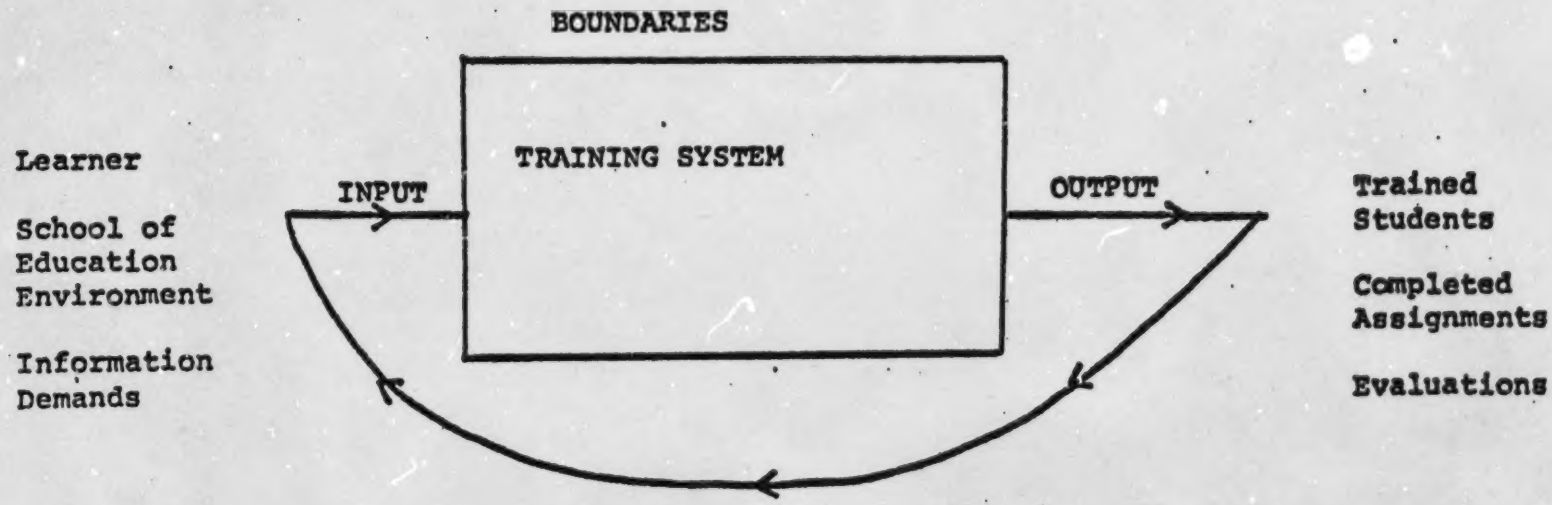


Figure 1. The cybernetic model of the information utilization training system for education students.

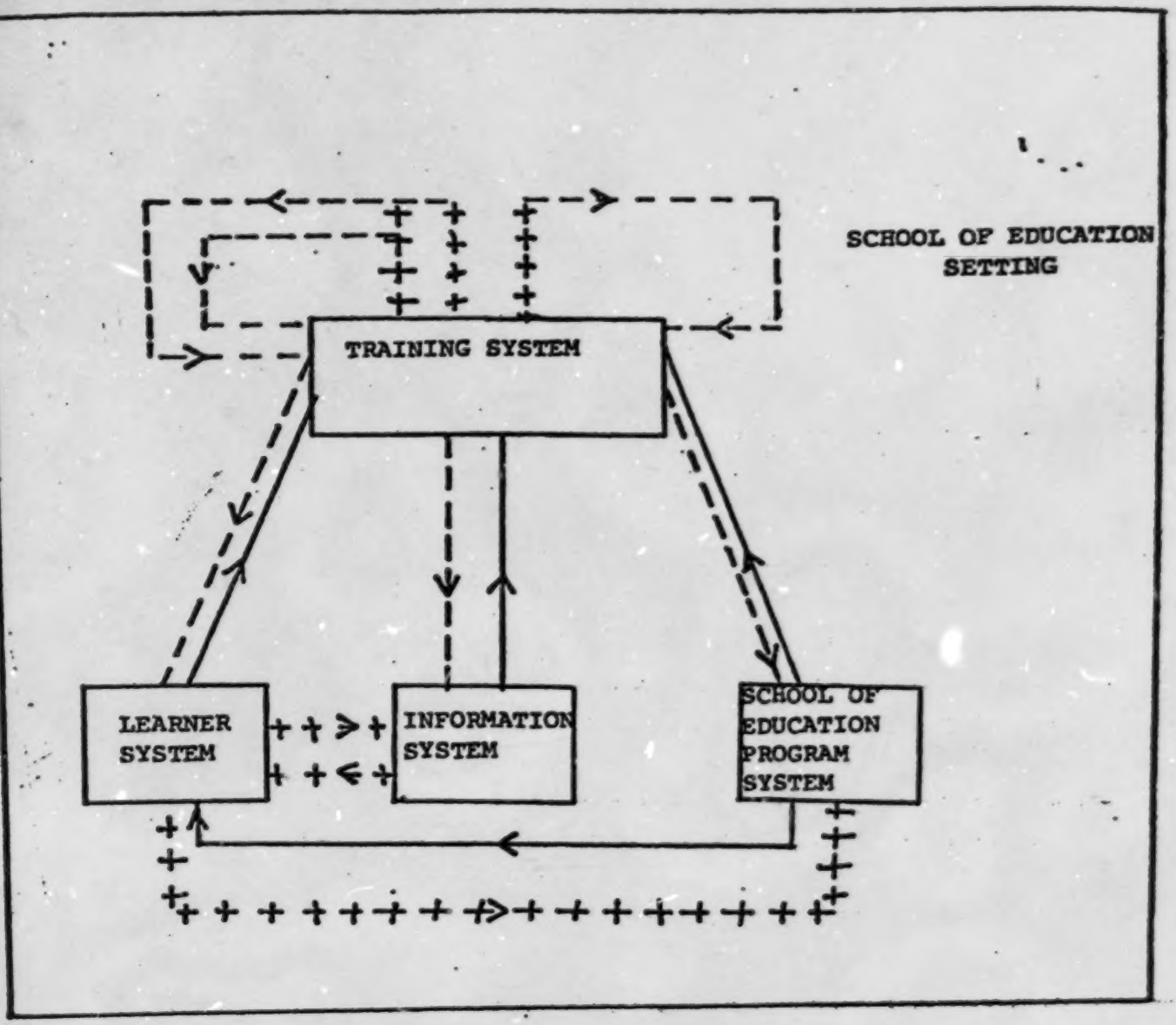


Figure 2. The operational model of the information utilization training system for education students.

Input as demands and resources= ————————

Feedback= - — - - - - - - -

Output= + + + + + + + + +

Table I. Input and Output as shown in Figure 2

System	Input		Output
Information Utilization Training System for Education Students	Demands Need for information by learner. Professor's demands of students. Student demands on information system.	Resources Information Sources. Training Program. Trainer. Assessment Methods.	Trained students, users of education information. Professors satisfied with student assignments. Evaluations of the success of the system (Feedback).
Subsystems			
Learner System	Need for information by learner. Skills to access information.	Training Program. Trainer. Information Sources.	Information seeking skills. Needed information. Better scholastic performance.
School of Education Program System	Assignments directed by coursework	Schoolof Education environment. Trainer. Training Program. Information System. Assessment Methods.	Better scholastic performance. Needed information. Quality of degrees granted.
Information System	Access Capabilities.	Products (Books, Journals) Services (Information retrieval, interlibrary loan) Storage and Retrieval Systems (Catalogs, Data Bases, Indexes) Places (Libraries, Information Centers).	Information Sources and Services. Innovative Information Seeking Behavior.

Figure 3. Process components in the training system.

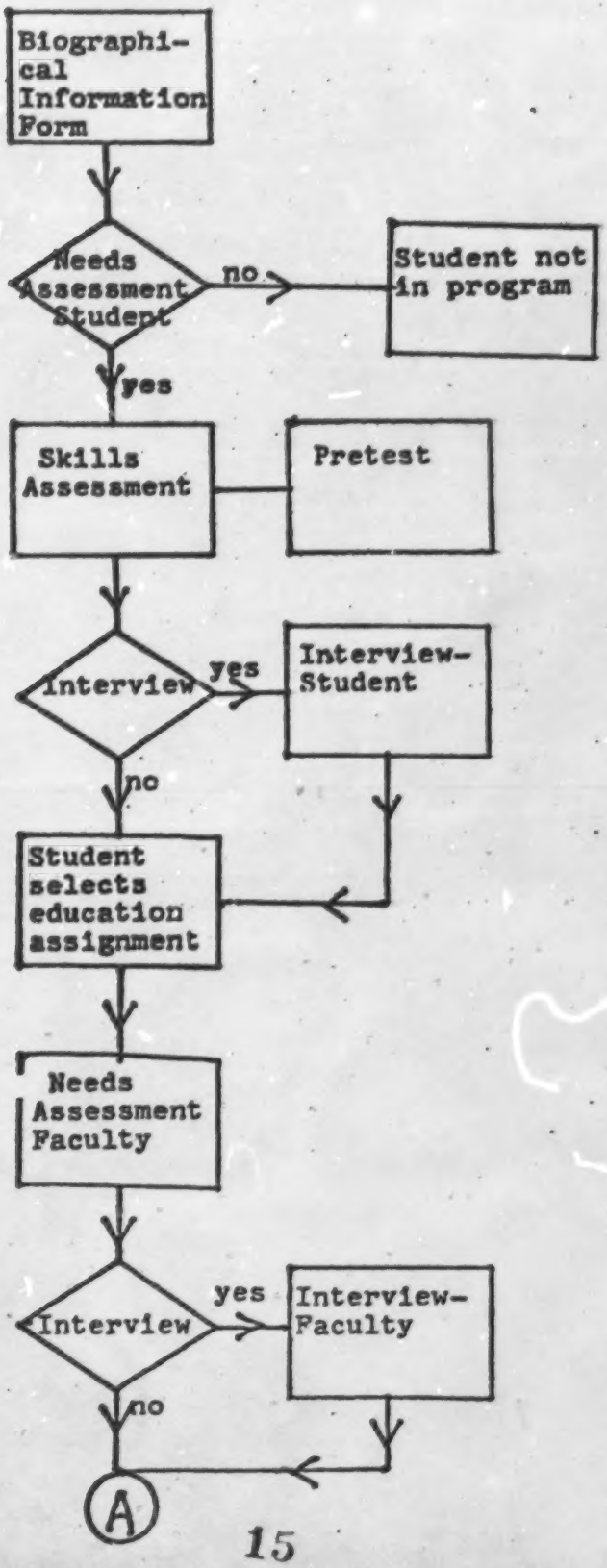


Figure 3 continued

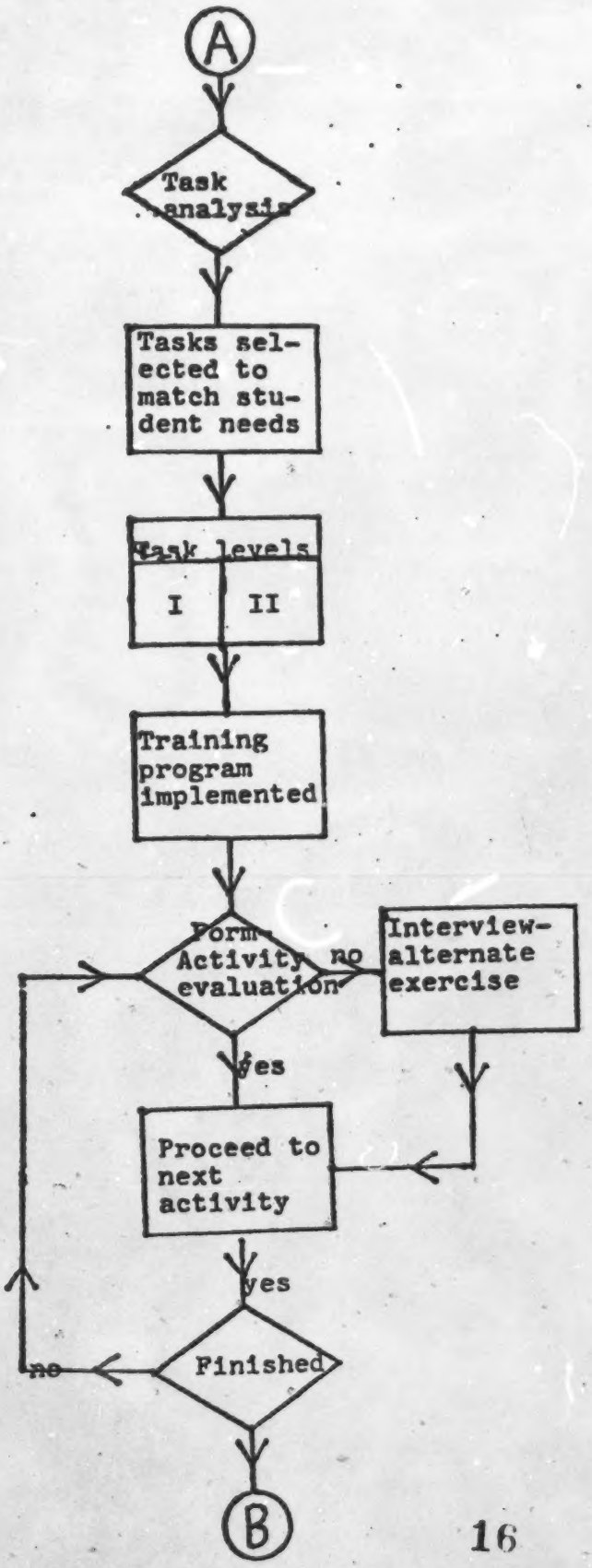


Figure 3 continued

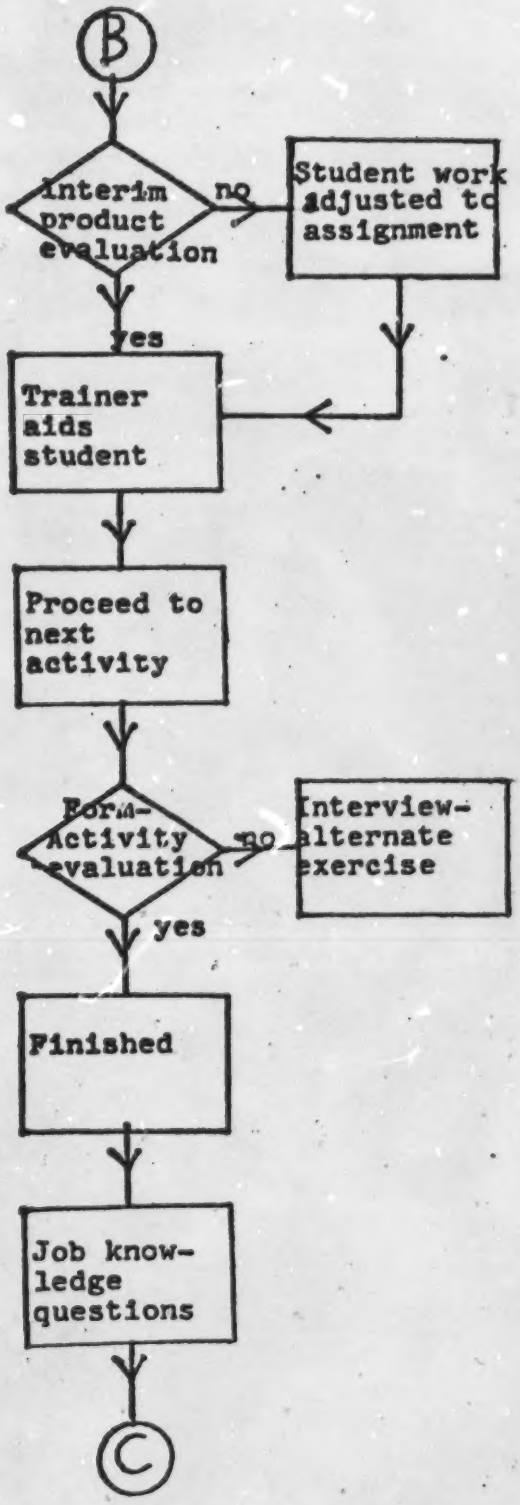
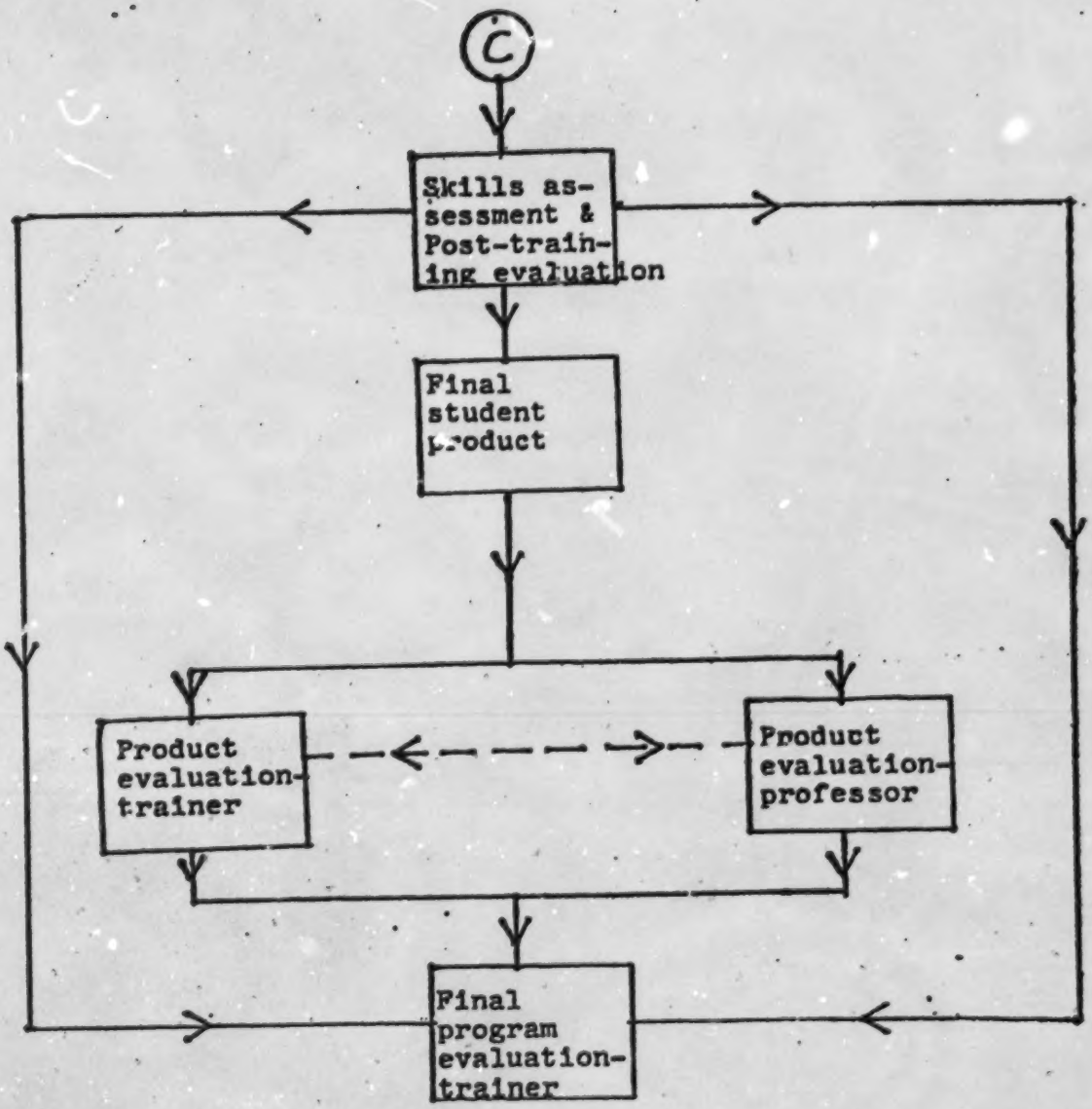


Figure 3 continued



References

Hawes, Leonard C. Pragmatics of Analoguing: Theory and Model Construction in Communication. Reading, Mass.: Addison-Wesley, 1975.

Maccia, E.S., Maccia, G.S. and Jewett, R.E. Construction of Educational Theory Models. Columbus, Ohio: Ohio State University University, 1963. ERIC Document ED 003 291

Maccia, G.S. An Educational Theory Model: General Systems Theory. In E.S. Maccia, G.S. Maccia and R.E. Jewett, Columbus, Ohio: Ohio State University, 1963, Pp. 143-172.